ide sensitive electrode is transferred along lead **50** to the control unit **48**, which in turn activates either display monitor **52** or alarm unit **56**.

According to still another practice, and as is known, every color corresponds to one or more different wavelengths of light. Thus, a change in color from one wavelength to another may be detected by suitable electronic circuitry or an optical detection system that is coupled to the gas sensor **40**. This color detection system preferably generates electrical signals characteristic of the colorimetric change within the gas sensor **40** and is transferred to the control unit **48** by electrical lead **50**. The control unit **48** receives the electrical signals generated by the detection system and triggers either the monitor display **52** or the alarm **56**.

As mentioned above, a significant aspect of the present invention is the ability of the mask **20** to continuously monitor the respiration of the patient. By employing a calorimetric carbon dioxide sensor, the gas-sensing mask visually indicates the presence or absence of a selected respired gas, such as carbon dioxide. Thus, hospital clinicians working or located in an area within visual range of the gas-sensing mask **20** can monitor the patient's breathing from afar, rather than requiring the clinician to be located relatively close or adjacent to the patient. Thus, by simply looking at the gas-sensing mask **10** the hospital personnel can rapidly and instantaneously detect changes in the respiratory rate or breathing faculty of the patient. In order to enhance the easy viewing of the respiratory rate of the patient, the sensor **40** can be appropriately sized to allow easy viewing from a number of distances and locations relative to the patient.

In operation, the gas-sensing mask **20** is placed over the patient's face and secured to the patient's head by the strap **16** and clip **26**. If the gas sensor **40** is not already mounted within the mask, the sensor is disposed therein at this juncture. The oxygen adapter is then matingly engaged with the female luer lock connector (if not already molded thereon) to provide a fluid lumen between the fluid chamber **24** of the mask **20** and the oxygen source. The patient's respiration is then monitored.

According to the teachings of the present invention, the patient's breathing can be monitored in a number of ways. During monitoring, when the patient inhales, the preferred gas sensor **40** of the invention calorimetrically detects the presence of oxygen in the fluid chamber **24** by changing to a selected color, e.g., purple. When the patient exhales, the carbon dioxide present in the respired gas is channeled by baffles **44** to the sensor which then changes to a second selected color, e.g., yellow. This continually changing series of colors visually indicates the breathing rate and faculty of the patient.

According to another practice of the invention, the gas sensor selectively triggers a remote indicating device, which preferably includes the control unit **48**. The control unit **48** in turn triggers either the alarm **56** or the monitor **52**. Thus, the attending clinician is rapidly notified of a change in the respiratory pattern of the patient by either peripheral device. Alternatively, a pH electrode or transistor is coupled to the mask **20** or gas sensor and is connected to the control unit **48**. A change in pH created electrically by the presence of carbon dioxide induces the device to emit electrical signals. These electrical signals are coupled to the control unit **48** by leads **46** or **50**. The control unit then triggers either the monitor **52** or the alarm **56**.

FIG. **4** illustrates a second embodiment of the gas-sensing mask **80** of the present invention. The illustrated mask **80** includes a non-porous housing **82** that has a top portion **82**A, an intermediate portion **82**B, and a bottom portion **82**C. The bottom portion **82**C has formed therein a fluid conduit aperture that has a female luer lock connector **84**. A mating fluid adapter **86** couples to the female luer connector **84**, as shown.

The illustrated intermediate portion **82**B of the mask includes an upwardly extending mask portion **90** which terminates in a sensor mounting aperture **92**. The upwardly extending mask portion can be a separate piece that is welded to the housing **82** or can be integrally molded with the housing to form a one-piece, e.g., unitary, structure.

A gas sensor **96** according to the present invention is mounted within the sensor mounting aperture **92** and intimately contacts the upwardly extending mask portion **90**. The gas sensor **96** is preferably similar (in structure and operation) to the gas sensor **40** of FIGS. **1–3**. A set of baffles **100** is preferably mounted on an interior portion of the mask or form part of the upwardly extending portion if provided as a separate piece, to channel respired gases to the gas sensor **96**.

A ventilation aperture **102**, identical to those described above in relation to FIGS. **1** through **3**, is formed on opposite sides of the gas mask **80**. The gas mask can be secured to the head of the patient by the illustrated straps and pressure tab, as described above.

The illustrated gas sensor **96** can be coupled to the control unit **48** of FIG. **1** by suitable electrical leads, as described above, and can further operate in conjunction with the above-described carbon dioxide sensitive electrodes or transistors, and with known optical detection systems.

This embodiment of the gas mask **80** illustrates the different mask housing designs which can be used in accordance with the teachings of the present invention, and which enable a gas sensor to be directly mounted thereon and to be coupled to an oxygen source.

It will thus be seen that the invention efficiently attains the objects set forth above, among those made apparent from the preceding description. Since certain changes may be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are to cover all generic and specific features of the invention described herein, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A gas detecting mask, comprising

a non-porous housing sized to seat over the nose and mouth of a subject, said mask having aperture means forming an aperture in a bottom portion of said housing, said aperture being sized to seat a fluid conduit, and

a passive colorimetric gas sensor disposed within a corresponding sensor mounting aperture formed in said mask for sensing one or more selected gases respired by the subject, said colorimetric gas sensor visually indicating the presence or absence of the respired gas, wherein said sensor when mounted within said mounting aperture being integrally formed with said housing and disposed in intimate contact therewith, such that a portion of said sensor is mounted to the outer external surface of said mask, and said calorimetric change of